

REMARKS

In the pending final office action, the Examiner maintains the rejections of the previous office action. Specifically, the Examiner rejected claims 1 – 3, 8 – 17, 20 – 23, and 27 – 32 under §102(b) as anticipated by U.S. Patent No. 5,889,827 to Bottomley et al., herein referred to as Bottomley. The Examiner also rejected dependent claims 18, 26, and 26 under §103 over Bottomley and other references. In the response dated 3 February 2004, Applicants argued that Bottomley discloses a method and apparatus for estimating a composite channel of a wireless system using knowledge of the pulse shaping (Abstract). The composite channel estimate includes the response associated with the transmit filter, the transmission medium response, and the response associated with any receive filters (column 4, lines 21-24). Contrastingly, the claimed invention relates to estimating the response of the pulse-shaping filter in the receiver based on known symbols, such as known training symbols. Essentially, Applicants argued that there is nothing in Bottomley that teaches or suggests a pulse estimator that estimates the impulse response of a pulse-shaping filter in a receiver, much less determining the impulse response of the receive filter based on a sampled version of a sequence of received signals and an expected plurality of training symbols, as claimed in the pending application.

The Examiner disagrees with Applicants' assessment of Bottomley. According to the Examiner, Bottomley discloses that knowledge of the transmit and receive filter responses can be used to improve estimation of the composite channel response (column 4, lines 49 – 51). Based on this, the Examiner asserts that Bottomley does

disclose calculation of a pulse shaping filter impulse response as well as the other components of the rejected claims. Applicants disagree and offer the following remarks.

The section cited by the Examiner in support of his rejection states:

Recently it has become apparent that knowledge of the transmit and/or receive filter responses can be used to improve estimation of the composite channel response. This is disclosed in U.S. patent application Ser. No. 08,625,010 (Docket P06901-RCUR, filed Mar. 29, 1996), which is incorporated herein by reference. (column 4, lines 49 – 54)

The patent application cited above is now U.S. Patent No. 5,838,739. First, it is important to note that the cited section of Bottomley simply discloses that knowledge of the transmit and receive filter responses can be used to improve the composite channel response estimate. This section says nothing about how the transmit and receive filter responses are obtained. In rejecting the claims the Examiner simply assumes that the filter responses are calculated. This assumption is wrong.

A careful review of the '739 patent shows that the transmit and receive filter responses alluded to in Bottomley are not estimated. Instead, a selected level of distortion associated with the transmit and receive filters is used to modify a sequence of known symbols to form a data word, which is stored in the receiver. The receiver uses the stored data word to simplify the calculations associated with estimating the response of a transmission channel, where a transmission channel corresponds to the composite channel of Bottomley. Specifically, the '739 patent samples a received signal and correlates portions of the sampled signals with the stored data word. The portions of the sampled signals exhibiting the greatest correlation are input to an equalizer and a

decoder for further processing. See, for example, column 3, line 48 through column 4, line 53 of the '739 patent. See also column 5, line 61 through column 7, line 6.

In other words, the '739 patent modifies known symbols to simulate the effect of the transmit and receive filters on the received signal. There is nothing in the '739 patent to teach or suggest actual calculation or estimation of the combined transmit and receive filter responses, much less the calculation or estimation of the receive filter response alone. Because the '739 patent does not calculate the impulse response of the receive filter, the teachings of the '739 patent incorporated into the Bottomley patent cannot be assumed to teach calculating the impulse response of the receive filter. As such, contrary to the Examiner's assertions, Bottomley does not teach or suggest calculating the impulse response of the receive filter.

Claim 1, *inter alia*, claims "a pulse-shape estimator coupled to the sampler, the pulse-shape estimator calculating an estimated impulse response of the pulse-shaping filter based on the sampled version of the received signal and on an expected plurality of training symbols" (emphasis added). As discussed above, Bottomley does not teach or suggest calculating an estimated impulse response of the pulse-shaping filter based on the sampled version of the received signal and on an expected plurality of training symbols. Further, Bottomley does not include a pulse-shape estimator. Therefore, Bottomley does not teach or suggest each and every limitation of claim 1, as required under §102. For at least these reasons, Bottomley cannot anticipate claim 1. Because Bottomley cannot anticipate claim 1, Bottomley cannot anticipate dependent claims 2-10. Applicants respectfully request reconsideration and allowance of claims 1-10.

Similarly, independent claims 20 and 28 both include the limitation “a pulse-shape estimator … calculating an estimated impulse response of the pulse-shaping filter.” Further, independent claim 11 includes the limitation “estimating an impulse response of the pulse-shaping filter based on the filtered signal and on an expected signal.” Therefore, for substantially the same reasons provided above with respect to claim 1, claims 11, 20, and 28 are also patentably distinct from the cited art. Because independent claims 11, 20, and 28 are patentably distinct, dependent claims 12 – 19, 21 – 27, and 29 – 32, respectively, are also patentably distinct from the cited art.

Applicants respectfully request reconsideration and allowance of claims 11-32.

Because, as argued above, each of the independent claims is patentably distinct from the cited art, the §103 rejections cited against dependent claims 18, 25, and 26 are rendered moot. As such, this response will not include any further discussion of these rejections.

Applicants also note that the previous response included specific arguments addressing the patentability of dependent claims 3, 9, 16 – 17, 22, and 32. However, the Examiner did not respond to these arguments. Should the Examiner maintain the rejection, Applicants specifically request a direct response to these arguments.

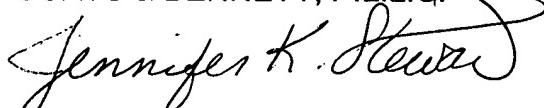
The Examiner should note that MPEP §706.05 requires that “the Examiner never lose sight of the fact that in every case the applicant is entitled to a full and fair hearing, and that a clear issue between the applicant and examiner should be developed, if possible, before appeal.” Accordingly, if the claims remain rejected, the Examiner is specifically requested to clarify the following issues for purposes of appeal by directly addressing the following questions/remarks:

1. Does the Examiner contend that the receiver of Bottomley (or the '739 patent) contains a pulse-shape estimator? If so, Applicants respectfully request the Examiner specifically identify this device in Bottomley (or in the '739 patent).
2. If the Examiner insists that Bottomley estimates the impulse response of the pulse-shaping filter (the receive filter), Applicants request that the Examiner specifically identify how Bottomley generates this estimate and how this relates to the claims of the present application.

In view of the above remarks, Applicants submit that the claims of the present invention are in condition for allowance and such action is respectfully requested. If any issues remain unresolved, the undersigned requests a telephone interview to expedite allowance and issuance.

Respectfully submitted,

COATS & BENNETT, P.L.L.C.



Jennifer K. Stewart
Registration No.: 53,639

P.O. Box 5
Raleigh, NC 27602
Telephone: (919) 854-1844

Dated: 7 June 2004